	Application No.	Applicant(s)
Notice of Allowability	10/743,872	PARK ET AL.
	Examiner	Art Unit
	DUC Q. DINH	2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *12/24/03*.

2. ☒ The allowed claim(s) is/are *1-12*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some*   c) ☐ None of the:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**
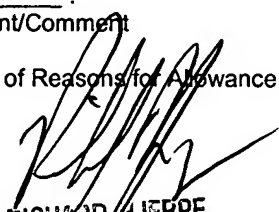
4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 09/12/06

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

RICHARD J ERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

DETAILED ACTION

1.   This Office Action is response to the Application filed on 12/24/2004. Claims 1-12 are

currently pending and being examined.

Allowable Subject Matter

2.   Claims 1-12 are allowed.

Reason for Allowance

3.   The present invention related to an optical navigation sensor, i.e. optical mouse, using

image pixel array for calculating and converting analog voltage value of pixels of an image array

into digital voltage values each having a certain bit value through a pre-process, in order to

prevent the pixel values from being varied, thereby accurately tracing a motion of the optical

mouse. Each independent claim identifies the uniquely distinct features

"a pre-processor for sequentially receiving the digital voltage values from the A/D

converter for all pixels of the current support surface image in accordance with a predetermined

timing signal, performing a pre-process for the current support surface image, thereby producing

a pre-processed current image consisting of pixels each having a 2-bit digital voltage value, and

extracting, from the pre-processed current image, a pre-processed current central image having a

predetermined pixel array; and a motion coordinate calculator for setting, as X/Y-axis reference

image candidates, the pre-processed current central image received from the pre-processor,

calculating an X-axis motion vector while overlapping a previously-set X-axis reference image

with the pre-processed current image, thereby calculating an X-axis motion coordinate value of

the pre-processed current image, and calculating a Y-axis motion vector while overlapping a

previously-set Y-axis reference image with the pre-processed current image, thereby calculating

a Y-axis motion coordinate value of the pre-processed current image." (claim 1) OR

"performing, by the pre-processor, a pre-process for the digital voltage values of

respective pixels sequentially received from the memory in accordance with a predetermined

timing signal, thereby producing a pre-processed current image, and extracting a pre-processed

current central image from the pre-processed current image;

determining, by a motion coordinate calculator, whether or not the pre-processed current

central image is to be set as X/Y-axis reference images for calculation of motion coordinate

values of a next pre-processed image, based on a motion vector of the pre-processed current

image; and

comparing, by the motion coordinate calculator, the pre-processed current image received

from the pre-processor with X/Y-axis reference images respectively stored in X/Y-channel

reference units, thereby calculating X/Y-axis motion coordinate values of the pre-processed

current image." (claim 5)

The closest prior arts of Piot et al. (U.S Patent No. 6,927,758) and Shen et al. (U.S Patent

No. 6,697,052) show similar optical mouse systems, which also use image pixel array of the

optical mice for calculating and converting analog voltage value of pixels of an image array into

digital voltage values each having a certain bit value through a pre-process, for accurately tracing

a motion of the optical mouse, but either singularly or in combination, fail to anticipate or render

above quoted limitations obvious.

4.   Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for

Allowance."

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to DUC Q DINH whose telephone number is (571) 272-7686. The

examiner can normally be reached on Mon-Fri from 8:00.AM-4:00.PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richard Hjerpe can be reached on (571) 272-7691. The fax phone number for the

organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUC Q DINH
Examiner
Art Unit 2629

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600